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Editorial

NEW CONSTITUTION

The Wireless Institute of Australia, which is the oldest active body of Amateurs in the world, has achieved a position of high standing in Australia and all overseas countries through its meritorious work on behalf of the Amateurs of this country. It has done all this in spite of its limited constitution.

One of the ways the Institute intends to guard and improve this fine reputation is by revising this rather inadequate constitution. The Constitution will be an instrument which defines the objectives and the mode of organisation of your Institute more thoroughly than in the past.

Our existing constitution was drawn up in 1939 as an interim one, and it was proposed to make improvements in the following year. However, the 1939-45 war intervened, and postponed that work until now.

At the Federal Convention held in April 1946, the first since 1939, it was unanimously agreed by all the Divisions that a new Constitution should be drawn up and adopted eventually by the several Divisions.

The Federal Executive has been preparing a Draft Constitution during the past few months on the following general bases:—

(a) The Federal Council shall be the governing body.
(b) The Federal Executive shall be the executive body.
(c) The Divisions shall be the bodies charged with the local administration and giving effect to the Federal policy of the Institute.
(d) The members shall be of various sections and shall provide the funds to carry on the work of the Institute.

(Continued on Page 4)

IN THIS ISSUE

SIMPLIFIED DESIGN OF TANK CIRCUITS FOR R.F. AMPLIFIERS. Part II.

BY W. T. S. MITCHELL, VK3UM*

1—GENERAL

As mentioned in Part 1 of this article, this part will deal with the coil design for the tank circuit, that is, actual diameters, lengths, turns, and wire sizes for the coils.

This side of the problem proved more tedious and somewhat more difficult than the determination of the L/C ratios. This was mainly due to the fact that so much information is obtainable on this subject from various experimenters, and it has meant co-relating this information and putting it into tabular form.

The main differences in these experimenters' results seem to be in regard to the length to diameter ratios. It might here be explained that the inductance obtained from these formulae is the "current sheet" inductance, so therefore a correction has to be applied when the turns are spaced, and round in section.

The formulae we will use, however, is one which has been determined experimentally, and so is accurate enough for our purposes. In fact, it checks very closely with theoritical figures, and has a very small percentage error over a wide range of length to diameter ratios.

2—CALCULATION OF NUMBER OF TURNS

The table to follow has been compiled from the experimental findings of Pollack (QST, Feb., 1939). Pollack's formula for inductance is:—

$$L = \frac{D\,N^2}{40.16\,S + 17.72} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ (1)$$

where L = inductance of coil in microhenries.
D = mean diameter of coil in inches.
N = number of turns.
b = length of coil in inches, and

$$S = \frac{b}{D}$$

This may be rewritten as:—

$$N = \sqrt[3]{\frac{40.16\,S + 17.72}{D}} \times \sqrt[3]{L} \quad \ldots\ldots\ (2)$$

In Table 1, A equals this value:—

$$\sqrt[3]{\frac{40.16\,S + 17.72}{D}}$$

The problem that confronted the writer was the substitution of values of b and D in this expression, and after quite a few headaches and sore eyes, the table was completed. It is not the full table that is presented here, but an extract which covers most of the transmitting coil sizes. However, for all its trouble, it has been considered worthwhile because of its very usefulness to the newcomer to radio.

So our turns can now be written:—

$$N = A\sqrt[3]{L} \quad \ldots\ldots\ldots\ldots\ldots\ (3)$$

3—SELECTION OF D AND b

It can be seen from the Table, that both the diameter and length of coil must be obtained to find A. There is no accurate way of determining either, so it means selecting a value of D and one for b, which follow generally accepted ideas.

Experiments have shown that the coil Q increases with D, b being constant, and also Q increases with b, D being constant. The Q increases rapidly for small values of b/D and more slowly for larger values of b/D (when b is greater than D).

* 1946 Lower Malvern Road, East Malvern, Vic.

Co-relating these various facts, it follows that the larger the diameter we can use, consistent with practical limitations, the better our coil will operate. Most experimental work has also shown that for minimum RF coil losses, the length of the coil should be between ½ and ¾ the diameter of the coil. It is also good practice to use an airwound coil in preference to a former wound one. The turns should only be supported at the least number of places to achieve sufficient mechanical stability.

So when choosing the values of D and b, it is important to bear these few points in mind, and make the selection accordingly.

4—DETERMINATION OF WIRE SIZE

The factor B appearing under A in Table 1 is used to obtain the correct wire size. Pollack, by laboratory work, has ascertained the optimum diameter of wire to be used. The value gives minimum RF copper losses, and hence an improvement in Q. This formula simply states that optimum wire size is obtained when it equals .707 times the winding pitch or in equalled form:—

$$d = \frac{1000\,b}{\sqrt[3]{2\,N}} \quad \ldots\ldots\ldots\ldots\ldots\ (4)$$

where d = diameter wire in mils. (1/1000th of an inch)
b = length of coil in inches.
N = number of turns.

Substituting equation (3) in equation (4) we obtain:—

$$d = \frac{1000\,b}{\sqrt[3]{2} \times A\sqrt[3]{L}}$$

or in different form:—

$$d = \frac{1000\,b}{\sqrt[3]{2\,A}} \times \frac{1}{\sqrt[3]{L}} \quad \ldots\ldots\ldots\ldots\ (5)$$

So in Table 1, factor B is made equal to:—

$$\frac{1000\,b}{\sqrt[3]{2\,A}}$$

So now our wire diameter can be expressed:—

$$d = \frac{B}{\sqrt[3]{L}} \quad \ldots\ldots\ldots\ldots\ldots\ (6)$$

By comparing equation (3) and (6), we can see that we have N and d in convenient forms of the square root of the inductance. So that by taking the square root of the inductance obtained from the Table in Part 1 of this article, and using our constants A and B, we have a simple means of calculating N and d.

To illustrate the simplicity of the use of the Table, we will take one or two examples.

(i) Assume our inductance from Part 1 was found to be 9.5 microhenries.

Let D = 2½ inches and b = 1½ inches.
From the Table, A = 4.1 and B = 259.

Therefore $N = 4.1 \times \sqrt[3]{9.5} = 4.1 \times 3.08 = 12.6$ turns

and $d = \frac{259}{\sqrt[3]{9.5}} = \frac{259}{3.08} = 84$ mils.

From Table 2, d = 14 S.W.G. Enamel.

By referring to Table 2 we may obtain the wire gauge corresponding to the calculated mils.

(ii) Assume L = 12.3 microhenries.

Therefore $\sqrt[3]{L} = 3.5$
Let D = 1½ inches, b = 1 inch.
From Table 1, A = 5.4 and B = 131.
Therefore $N = 5.4 \times 3.5 = 18.9$ turns.

TABLE 1

TRANSMITTING COIL FACTORS

Winding Length in Inches "B"	Constant	DIAMETER "D" INCHES										
		1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
1	A	5.4	4.8	4.3	4.0	3.7	3.4	3.2	3.0	2.9	2.7	2.6
	B	131	147	165	177	192	208	221	236	244	262	272
1¼	A	5.8	5.2	4.6	4.2	3.9	3.6	3.4	3.2	3.0	2.9	2.8
	B	153	170	192	211	227	246	260	276	294	305	315
1½	A	6.2	5.5	4.9	4.4	4.1	3.8	3.5	3.3	3.2	3.0	2.9
	B	171	193	216	241	259	279	303	321	331	354	366
1¾	A	6.6	5.8	5.1	4.7	4.3	4.0	3.7	3.5	3.3	3.1	3.0
	B	187	214	243	263	287	309	334	354	376	399	413
2	A	6.9	6.0	5.4	4.9	4.5	4.1	3.9	3.6	3.4	3.2	3.1
	B	205	236	262	288	315	345	362	393	416	442	456
2¼	A	7.2	6.3	5.6	5.1	4.6	4.3	4.0	3.7	3.5	3.3	3.2
	B	221	253	285	312	346	370	398	430	455	482	497
2½	A	7.5	6.6	5.8	5.3	4.8	4.4	4.1	3.9	3.6	3.4	3.3
	B	236	269	305	333	368	402	431	453	491	520	536
2¾	A	7.8	6.8	6.0	5.4	5.0	4.6	4.3	4.0	3.8	3.5	3.4
	B	250	286	324	360	389	423	453	486	512	556	573
3	A	8.1	7.0	6.2	5.6	5.1	4.7	4.4	4.1	3.9	3.6	3.5
	B	263	304	342	379	416	452	483	518	544	590	606
3¼	A	8.3	7.3	6.4	5.8	5.3	4.9	4.5	4.2	4.0	3.7	3.5
	B	277	315	359	397	434	470	511	548	575	622	656
3½	A	8.6	7.5	6.6	6.0	5.4	5.0	4.6	4.3	4.1	3.8	3.6
	B	288	331	376	413	458	495	539	576	604	652	688
3¾	A	8.9	7.7	6.8	6.1	5.6	5.1	4.8	4.4	4.2	3.9	3.7
	B	298	345	391	434	474	520	552	603	632	681	716
4	A	9.1	7.9	7.0	6.3	5.7	5.3	4.9	4.5	4.3	4.0	3.8
	B	311	358	405	449	497	534	578	629	658	707	744
4¼	A	9.4	8.1	7.2	6.5	5.9	5.4	5.0	4.7	4.4	4.1	3.9
	B	320	371	418	463	509	557	601	640	684	733	770
4½	A	9.6	8.3	7.4	6.6	6.0	5.5	5.1	4.8	4.5	4.2	4.0
	B	332	382	430	483	531	579	624	663	707	759	796
4¾	A	9.8	8.5	7.5	6.7	6.1	5.6	5.2	4.8	4.5	4.3	4.0
	B	343	396	448	501	551	600	646	700	747	782	840
5	A	10.0	8.7	7.7	6.9	6.3	5.7	5.3	4.9	4.6	4.4	4.1
	B	354	407	460	513	562	621	668	722	769	804	863
5¼	A	10.3	8.9	7.8	7.0	6.4	5.9	5.4	5.0	4.7	4.4	4.2
	B	360	417	477	531	581	630	688	743	789	843	884
5½	A	10.5	9.1	8.0	7.2	6.5	6.0	5.5	5.1	4.8	4.5	4.3
	B	371	427	486	540	598	649	707	762	810	865	905
5¾	A	10.7	9.3	8.2	7.3	6.6	6.1	5.6	5.2	4.9	4.6	4.3
	B	380	437	497	557	617	667	726	782	830	884	946
6	A	10.9	9.4	8.3	7.4	6.8	6.2	5.7	5.3	5.0	4.7	4.4
	B	390	451	511	574	624	685	745	801	849	904	965

Formulae:- $L = \frac{D\,N^2}{40.16\,S + 17.72}$ $\quad do = \frac{1000\,b}{\sqrt[3]{2\,N}}$

$N = A\sqrt[3]{L}$ Turns $\quad do = \frac{B}{\sqrt[3]{L}}$ Mils.

$$d = \frac{131}{3.5} = 37.5 \text{ mils.}$$

From Table 2, d = 20 S.W.G. Enamel.

5—CONCLUSION

At some future date, it is expected that values as given, may be checked by laboratory experiment, and the results published.

In concluding, it is only hoped that this article will prove as useful to the reader, as it has proved to the writer in the past. More accurate design data is available on RF Amplifiers L/C ratios in various textbooks, but even so, this article still will have its usefulness in preliminary design work.

TABLE 2

Gauge	S.W.G.		
	Bare	Enamel & Tin.	D.C.C.
10	144 — 116	148 — 120	158 — 130
12	116 — 92	120 — 96	130 — 106
14	92 — 72	96 — 75.5	106 — 84
16	72 — 56	75.5 — 59	84 — 68
18	56 — 40	59 — 42.6	68 — 51
20	40 — 34	42.6 — 36.4	51 — 45
21	34 — 30	36.3 — 32.2	45 — 41
22	30 — 26	32.1 — 27.9	41 — 36.5
23	26 — 23	27.8 — 24.7	36.5 — 33
24	23 — 21	24.6 — 22.6	33 — 31
25	21 — 19	22.5 — 20.5	31 — 29
26	18 — 17.2	20.4 — 18.6	29 — 27.2
Gauge	B. & S.		
	Bare	Enamel & Tin.	D.C.C.
10	114.4 — 90.7	116.5 — 92.7	126.4 — 100.2
12	90.6 — 72	92.6 — 74	100.1 — 81.5
14	71.9 — 57.1	73.9 — 59.1	81.4 — 66.6
16	57 — 45.3	59 — 47.1	66.5 — 54.8
18	45.2 — 35.9	47 — 37.7	54.7 — 45.4
20	35.8 — 30.2	37.6 — 32	45.3 — 39.8
21	30.1 — 26.9	31.9 — 28.6	39.7 — 35.9
22	26.8 — 24	28.5 — 25.6	35.8 — 32.5
23	23.9 — 21.3	25.5 — 22.8	32.4 — 29.9
24	21.2 — 19	22.7 — 20.4	29.8 — 27.5
25	18.9 — 16.9	20.3 — 18.2	27.4 — 25.4
26	16.8 — 15.1	18.1 — 16.2	25.3 — 23 9

EDITORIAL.

Federal Executive has given much thought to these objectives in the preparation of a Draft Constitution which is about to be circulated among the Divisions for comment. It is hoped that the next Federal Convention will ratify the completed Constitution.

The objective of this Constitution will be to ensure that the Wireless Institute of Australia acts as one homogeneous body and speaks with one great voice on the affairs of the Amateur, both publicly and privately.

It must be the earnest desire of all members to support and see that such a Constitution makes your Institute an even greater organisation than it ever has been in the past.

R.J.M.

CLEARING THE ETHER.—Series II, Part VI

*By G. GLOVER, VK3AG

CONSTRUCTION AND OPERATION OF MODERN TRANSMITTER (Continued)

(b) Harmonic Amplification

A previous section covered the requirements of Harmonic Amplification or Frequency Multiplication in the Exciter Unit, with minimisation of controls as the major requirement; however, in the case of the R.F. Power Amplifier efficient resonant circuits are required in both grid and anode circuits. Thus, at least two controls per stage are inevitable.

In previous section it was suggested that the frequency-multiplier provided the ultimate frequency; however, under some circumstances it is desirable to further multiple the frequency in the power amplifier. For example, the exciter unit in question reaches 28 Mc/s, but the requirement is for 56 Mc/s; hence the most efficient method of reaching the latter frequency is to double in the power amplifier. Then again when tuning capacitors used are capable of tuning to the second harmonic without changing coils, it is quicker to leave exciter output, and grid circuit of P.A. set and tune the anode of P.A. to the harmonic.

Efficient harmonic generation or amplification in power amplifiers is best understood by reference to tabulated comparisons of various classes of amplifiers as set out hereunder:—

Class	Anode Efficiency	Operating Angle	Operating Conditions	Distortion	Power Ratio	Output
A	Relatively low, 30-40%.	360°	Biassed to swing equally about centre of linear portion Ip/Eg Curve. Grid quiescent.	Low. Minimum harmonic content.	High output from given size of tube.	Wave-form true reproduction of input, but at greater amplitude dependant upon effective amplification of stage.
B	Medium, 50-60% at Maximum signal level.	180°	Biassed to cut-off entire linear portion Ip/Eg Curve employed Grid is driven positive, hence power is dissipated in grid circuit.	Moderate. Moderate harmonic content.	Moderate.	A.C. component of anode current is proportional to square of grid excitation voltage. Wave shape approximates positive swing of grid voltage.
C	High 70-85%.	150° or less.	Usually biassed to twice cut-off or more. Grid is driven to saturation on positive peaks of input, causing distortion of output wave-form.	High. Large harmonic content.	Low. Power output high for given size of tube.	A.C. component of anode current is proportional to the anode voltage, power output is therefore proportional to the square of anode voltage.

There are other classes of amplifiers which have not been tabulated, notably, Class AB1 and AB2. These amplifiers operate under conditions between Class A and Class B, hence the designation "AB," Class AB1 is referred to as being quiescent, that is, tube does not draw grid current. In the Class AB2 amplifier on the other hand the grid of tube is driven positive, thereby drawing grid-power. The main object of this class of operation is to secure the advantages of Class A operation at low levels and the added output of Class B operation at high levels.

We have already shown how the use of correct L/C ratio in anode "tank" circuit will minimise effects of distortion in amplifier tube output, due to the presence of large flywheel effect. This means that if large value of L is used in comparison to C, the effects of distortion are magnified and an excellent harmonic amplifier results.

Where neutralised triodes used in P.A. operating at fundamental frequency, the change to even harmonic operation causes the neutralising circuit to provide positive instead of negative feedback, thus emphasising the even harmonics and resulting in considerable increase in the efficiency of frequency multiplier.

(c) Harmonic Elimination

In the preceding sub-section the object was to produce wanted harmonics—in this case the problem is to suppress unwanted harmonics. Not only do unwanted harmonics occupy unnecessary channel space in harmonically related "Ham bands," but also in the case of bands which are not harmonically related, cause considerable interferences to other services—earning the well-merited disapproval of the R.I. It is the duty of every Ham to suppress all unwanted harmonics, and a careful study of the conditions which cause harmonic production should provide clue to their suppression. The following sub-paragraphs outline some of the causes and suggest means of avoiding and eliminating unwanted harmonics:—

(1) Once again the correct L/C ratio of tank circuits plays a very important part. The Q of tank should be at least 12.
(2) Avoid over-excitation of Class "C" amplifiers.
(3) Prevent distortion of RF grid voltage wave-form.
(4) Employ link coupling and high Q-circuits between final driver and final stage to attenuate unwanted components as much as possible.

(5) Employ driver with large enough capacity to ensure good regulation of RF drive under all conditions of modulation when using "phone."

(6) Eliminate stray capacity couplings between final anode and aerial coupling circuits, by employing "Faraday Shield." The same story applies to offending interstage couplings.

(7) Employ selective aerial coupling unit.

(8) Use series resonant circuits to provide greater degree of attenuation of frequencies other than resonant frequency (usually only necessary in high power rigs).

(d) Parasitic Suppression

Parasitic oscillation is another bug bear which raises its ugly head to embarrass the user of transmitting equipment. Briefly it means that conditions exist in the transmitter or stage which cause self oscillation to occur at some frequency other than that selected. This spurious mode of oscillation causes considerable waste of good energy, unstable and erratic operation at operating frequency, and may be of unsustained character. In the latter case its presence may only be recognised by abnormal key clicks over wide range, or by the presence of spurious side bands in the case of "phone" transmitter.

Parasitics fall into various categories:—

(1) L.F. Parasitics.

(2) Parasitics near operating frequency.

(3) V.H.F. Parasitics.

(1) Low Frequency Parasitics.—Parasitics of this category are usually confined to frequencies below 500 Kc/s and are of the TPTG type. The RF chokes and allied bypass capacitors in plate and grid circuits forming the resonant elements. This effect is particularly noticeable in push-pull units when elements concerned operate both tubes in parallel. Arranging circuit to eliminate RF choke in either the grid or plate circuit is the answer to this problem.

(2) Parasitics near Operating Frequency.—This usually indicates that circuit employs coupling medium involving taps, that is, either the grid is tapped off portion of the coil, or grid and/or anode transmission lines are attached directly to tank coil. In the former case, the turns between grid and ground and plate and ground, plus stray capacities, provide the ingredients conducive to TPTG operation at a frequency somewhat higher than the normal operating frequency. In the latter case, the multi-resonant conditions set up result in oscillation at a frequency close to the normal operating frequency, at a point where it is un-neutralised. Furthermore if neutralising circuit leads have appreciable inductive reactance, the amplifier may be sufficiently un-neutralised as to oscillate at a frequency near the normal operating frequency.

Leaving the centre-point of split stator anode tank capacitor ungrounded is another cause of parasitic oscillation, due to current flowing through the neutralising lead and tank capacitor in similar manner to "Modified Colpitts" oscillator circuit.

(3) V.H.F. Parasitics.—Oscillations of TPTG or Ultraudion type caused by neutralising circuit connections associated with balanced tanks are sometimes encountered.

TESTING FOR PARASITICS

In order to test for parasitics of sustained and non-vicious nature a receiver, capable of being tuned over a wide range, should be employed to identify each emission of the transmitter, making due allowance for image frequency response of superheterodyne receiver.

If difficulty is experienced in neutralising the amplifier parasitic conditions may be suspected, provided of course that the neutralising circuit values are consistent with normal requirements.

After neutralising the amplifier it may be tested for self-starting oscillations by removing the excitation and applying sufficient bias to limit the anode dissipation in accordance with tube rating. Anode voltage is then applied, if the amplifier is free from parasitics the plate current will remain constant as the tank capacities are varied; also there will not be any grid current and a neon tube, applied to any part of the circuit, will not glow. "Trigger" oscillations present should be detectable in receiver in the form of abnormal clicks when anode supply is switched, or by momentary glowing of neon tube applied to certain parts of circuit. Care must be exerised to avoid confusing this latter effect with normal switching "flash."

In determining the nature and cause of parasitics one should set about the job in methodical manner. Commencing with the lowest frequency element if possible, this decision will be governed by nature of vicious parasitics.

In order to determine when low frequency parasitic is of parallel type, in the case of push-pull circuits, connect both grids or both anodes together. If the parasitic IS of parallel type the effect on oscillation will be barely perceptible, because these points are at the same potential. The amplitude of oscillations of this type are further increased by absence of neutralisation at parasitic frequency; furthermore, as the neutralising capacitors and grid/anode capacities are effectively in parallel, a large amount of energy is fed back to maintain oscillation at high level.

L.F. parasitics may be eliminated, as previously stated, by removing RF choke in either grid or anode circuit.

Parasitics near the operating frequency may be eliminated by discarding tapped tank coils and using low impedance links to couple grid and anode transmission lines.

VHF parasitics usually respond to one of the following methods:—

(1) Insertion of resistors of the order of one to one hundred ohms close to the grid or anode of tube for the purpose of damping circuits. Resistors employed should be either non-inductively wire-wound or preferably of the carbon type.

(2) Introduction of tuned circuit (resonant to parasitic frequency) in series with the grid circuit.

(3) Detuning anode or grid circuits, that is, the grid circuit is tuned to a much higher frequency than the anode circuit, achieved by keeping grid circuit leads short or by adding small choke coils, consisting of a few self-supporting turns of heavy wire, inserted in anode circuit near tube to increase the effective inductance in the anode circuit. Resistors may be added in parallel with the chokes, or alternatively the chokes may be wound of resistance wire, if necessary in order to prevent "trigger" oscillations; however, sufficient detuning of parasitic circuits usually accomplishes the same result. The choke coils serve another good purpose, that is, they improve the efficiency of amplifier and reduce harmonic components of anode current. For this reason it is desirable not to damp same with resistors unless "trigger" oscillations occur.

Several forms of parasitics may be present in the same unit, and do not be surprised if new parasitics appear as others are eliminated. The writer has found by experience that in vicious cases it is sometimes easier to insert everything but the kitchen sink, and then gradually remove each element separately until minimum requirement for stability has been reached. One transmitter had such vicious neutralising circuit characteristics, that it was necessary to employ resistance wire to effect connections. In another case it was necessary to employ bridge neutralising circuit which will be illustrated in diagram covering neutralising circuits.

Generally speaking VHF parasitic oscillations differ from high order harmonics in that the amplitude of the

(Continued on Page 28)

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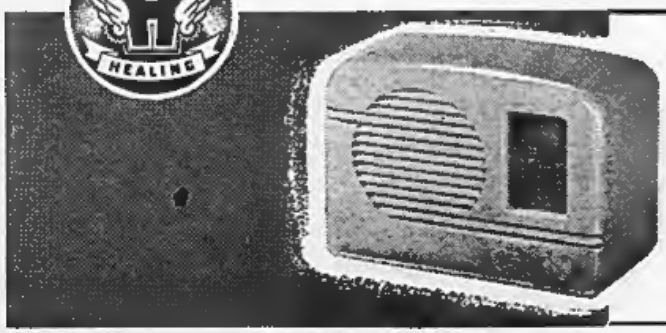

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NEW TUBES

RADIOTRON 2E26

VHF BEAM POWER AMPLIFIER

Radiotron type 2E26 is a beam power amplifier intended primarily for use in FM transmitters, either in low power driver stages, or in the output stage when only low power output is required. It is also useful in a-f power and modulator service.

Having high power sensitivity and high efficiency, the 2E26 can be operated at relatively low plate voltage to give large power-output with small driving power. Furthermore, it can be operated with full input to 125 megacycles.

Small in size for its power-output capability, the 2E26 features rugged button-stem construction with short internal leads, and an octal base with short metal sleeve which shields the input to the valve so completely that no other external shielding is required. Separation of input and output circuits is accomplished by bringing the plate lead out of the bulb to a cap opposite the base.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	Volts
Current	0.8	Ampere
Transconductance for plate current of 20 milliamperes	3500	Micromhos
Grid-Screen Mu-Factor	6.5	
Direct Interlectrode Capacitances:*		
Grid to Plate	0.20 max.	mmfd.
Input	13	mmfd.
Output	7	mmfd.

* With no external shielding and base sleeve connected to ground.

Mechanical:

Mounting Position	Any
Overall Length	3-1/2" plus or minus 5/32"
Seated Length	2-15/16" plus or minus 5/32"
Maximum Diameter	1-5/16"
Bulb	T-9
Cap	Small
Base	Small Wafer Octal 8-Pin with Sleeve No. R-6159

AF POWER AMPLIFIER AND MODULATOR —CLASS A1

Maximum Ratings, Absolute Values:

	CCS†	
DC Plate Voltage	300 max.	Volts
DC Grid—No. 2 (Screen) Voltage	200 max.	Volts
Plate Dissipation	10 max.	Watts
Grid—No. 2 Input	2.5 max.	Watts
Peak Heater-Cathode Voltage:		
Heater negative with respect to cathode	100 max.	Volts
Heater positive with respect to cathode	100 max.	Volts

Typical Operation:

DC Plate Voltage	250	Volts
DC Grid—No. 2 Voltage	160	Volts
DC Grid—No. 1 (Control Grid) Voltage	—12	Volts
Peak AF Grid—No. 1 Voltage	12	Volts
Zero-Signal DC Plate Current	35	Ma.
Max.-Signal DC Plate Current	42	Ma.
Zero-Signal DC Grid—No. 2 Current	7	Ma.
Max.-Signal DC Grid—No. 2 Current	10	Ma.
Load Resistance	5500	Ohms
Total Harmonic Distortion	10%	
Power Output	5.3	Watts

Maximum Circuit Values:

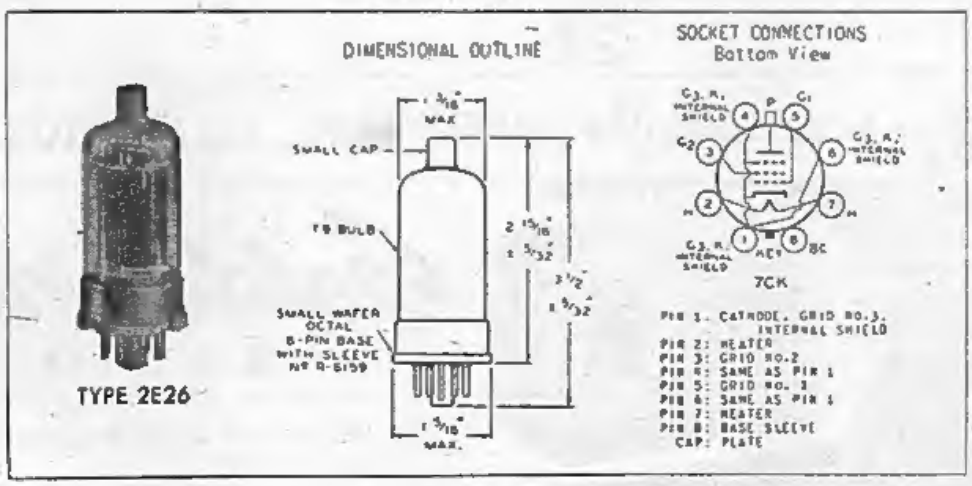
Grid—No. 1, Circuit Resistance	30000 max.	Ohms

PUSH-PULL AF POWER AMPLIFIER AND MODULATOR—CLASS AB2*

Values are for two valves

Maximum Ratings, Absolute Values:

	CCS†	ICAS†	
DC Plate Voltage	400 max.	500 max.	Volts
DC Grid-No.2 (Screen) Voltage	200 max.	200 max.	Volts
Max.-Signal DC Plate Current**	150 max.	150 max.	Ma.
Max.-Signal Plate Input**	60 max.	75 max.	Watts



Max.-Signal Grid-No. 2 Input**	5.0 max.	5.0 max.	Watts
Plate Dissipation**	20 max.	25 max.	Watts
Peak Heater-Cathode Voltage.			
Heater negative with respect to cathode	100 max.	100 max.	Volts
Heater positive with respect to cathode	100 max.	100 max.	Volts

Typical Operation:

DC Plate Voltage	400	500	Volts
DC Grid-No. 2 Voltage¶‡	125	125	Volts
DC Grid-No. 1 Voltage (Fixed Bias)	—15	—15	Volts
Peak AF Grid-No. 1-to-Grid-No. 1 Voltage	60	60	Volts
Zero-Signal DC Plate Current	20	22	Ma
Max.-Signal DC Plate Current	150	150	Ma.
Max.-Signal DC Grid-No. 2 Current	32	32	Ma.
Effective Load Resistance (Plate to Plate)	6200	8000	Ohms
Max.-Signal Driving Power (Approx.)¶¶	0.36	0.36	Watts
Max.-Signal Power Output (Approx.)	42	54	Watts

PLATE MODULATED RF POWER AMPLIFIER —CLASS C TELEPHONY

Carrier conditions per valve for use with a maximum modulation factor of 1.0.

Maximum Ratings, Absolute Values:

	CCS†	ICAS†	
DC Plate Voltage	400 max.	500 max.	Volts
DC Grid-No. 2 (Screen) Voltage	200 max.	200 max.	Volts
DC Grid-No. 1 (Control Grid) Voltage	—175 max.	—175 max.	Volts
DC Plate Current	60 max.	60 max.	Ma.
DC Grid-No. 1 Current	3.5 max	3.5 max	Ma.
Plate Input	20 max.	27 max.	Watts
Grid-No. 2 Input	1.7 max.	2.3 max	Watts
Plate Dissipation	6.7 max	9 max.	Watts
Peak Heater-Cathode Voltage			
Heater negative with respect to cathode	100 max.	100 max.	Volts
Heater positive with respect to cathode	100 max.	100 max.	Volts

Typical Operation:

DC Plate Voltage	400	500	Volts
DC Grid-No. 2 Voltage††	(160	190	Volts
	(32000	35500	Ohms
DC Grid-No. 1 Voltage§	(—50	—50	Volts
	(20000	20000	Ohms
Peak RF Grid-No. 1 Voltage	60	60	Volts
DC Plate Current'	50	54	Ma.
DC Grid-No. 2 Current	7.5	9	Ma.
DC Grid-No. 1 Current (Approx.)	2.5	2.5	Ma.
Driving Output (Approx.)	0.15	0.15	Watt
Power Output (Approx.)	13.5	18	Watts

Maximum Circuit Values:

Grid-No. 1-Circuit Res.§§	30000 max.	30000 max.	Ohms

RF POWER AMPLIFIER AND OSCILLATOR —CLASS C TELEGRAPHY

Key-down conditions per valve without modulation‡‡

Maximum Ratings, Absolute Values:

	CCS†	ICAS†	
DC Plate Voltage	500 max.	600 max.	Volts
DC Grid-No. 2 (Screen) Voltage	200 max.	200 max.	Volts

DC Grid-No. 1 (Control Grid) Voltage	—175 max.	—175 max.	Volts
DC Plate Current	75 max.	75 max.	Ma.
DC Grid-No. 1 Current	3.5 max.	3.5 max.	Ma.
Plate Input	30 max.	40 max.	Watts
Grid-No. 2 Input	2.5 max.	2.5 max.	Watts
Plate Dissipation	10 max.	13.5 max.	Watts
Peak Heater-Cathode Voltage:			
Heater negative with respect to cathode	100 max.	100 max.	Volts
Heater positive with respect to cathode	100 max.	100 max.	Volts

Typical Operation:

DC Plate Voltage	400	500	600	Volts
DC Grid-No. 2 Voltage*	190	185	185	Volts
	19000	28500	41500	Ohms
DC Grid-No. 1 Voltage**	—30	—40	—45	Volts
	10000	13500	15000	Ohms
Peak RF Grid-No.1 Voltage	41	50	57	Volts
DC Plate Current	75	60	66	Ma.
DC Grid-No. 2 Current	11	11	10	Ma.
DC Grid-No. 1 Current (Approx.)	3	3	3	Ma.
Driving Power (Approx.)	0.12	0.15	0.17	Watt
Power Output (Approx.)	20	20	27	Watts

Maximum Circuit Values:

Grid-No. 1-Circuit Res.§§ 30000 max. 30000 max. Ohms

* Subscript 2 indicates that grid current flows during some part of input cycle.

** Averaged over any audio-frequency cycle of sine-wave form.

¶ Preferably obtained from a separate source, or from the plate-voltage supply with a voltage divider.

‡ In applications requiring the use of screen voltages above 135 volts, provision should be made for the adjustment of grid-No. 1 bias for each valve separately

The necessity for this adjustment at the lower screen voltages depends on the distortion requirements and on whether the plate-dissipation rating is exceeded at zero-signal plate current.

¶¶ Driver stage should be capable of supplying the No. 1 grids of the class AB2 stage with the specified driving power at low distortion. The effective resistance per No. 1 grid circuit of the class AB2 stage should be kept below 500 ohms and the effective impedance at the higher desired response frequency should not exceed 700 ohms

†† Obtained preferably from a separate source modulated with the plate supply, or from the modulated plate-supply through series resistor of the value shown.

§ Obtained from grid resistor of value shown or by partial self-bias methods.

§§ Any additional bias required must be supplied by a cathode resistor or a fixed supply.

‡‡ Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

• Obtained preferably from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of the value shown. The grid-No. 2 voltage must not exceed 600 volts under key-up conditions.

•• Obtained from fixed supply, or by grid-No. 1 resistor of value shown.

† CCS = Continuous Commercial Service; ICAS = Intermittent Commercial and Amateur Service.

Radiotron Lighthouse Valves

TYPES 2C40, 2C43 AND 559

These three valve types have been called "lighthouse" valves because of their distinctive appearance which results from their design features. These features are of vital importance in their UHF performance, and include:

1—Very close interelectrode spacing combined with low interelectrode capacitances.
2—RF and mutual DC cathode connections.
3—A unique arrangement in connections to the grid and plate.
4—A structural shape facilitating their use in concentric line circuits.

Types 2C40 and 2C43

Bottom View of Socket Connections

Pin 1—Internal connection, do not use.
Pin 2—Heater
Pin 3—Cathode.
Pin 5—Cathode
Pin 7—Heater.
Pin 8—Cathode.
Post and Disc Terminal Plate
Disc Terminal—Grid.
Shell—Cathode RF Terminal.

Radiotron types 2C40 and 2C43 are triodes for use in RF Amplifier and Oscillator service at frequencies up to approximately 3,000 Mc/s. Both types have low frequency drift with variations in heater and plate voltages. In addition, they are held to close electrical and mechanical tolerances to meet the exacting requirements of UHF circuit design.

Radiotron type 559 is a diode for operation in half wave rectifier services.

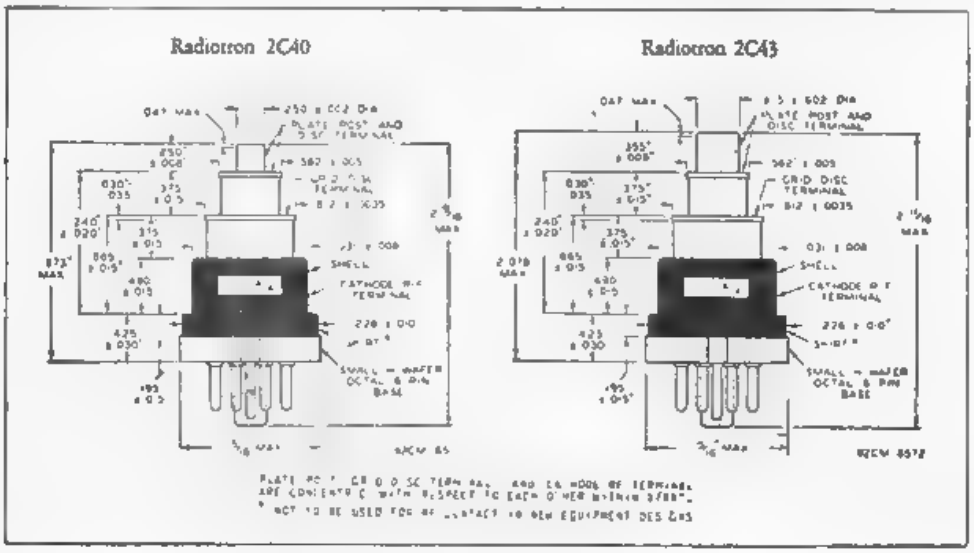
Types 2C40 and 2C43

General:

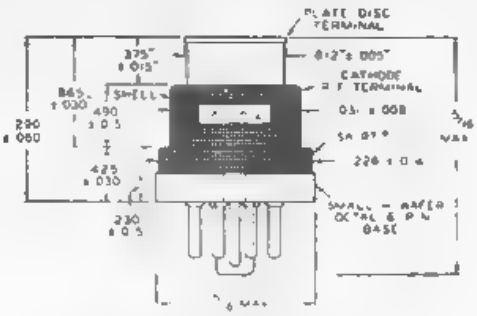
	2C40	2C43	
Heater, for Unipotential Cathode:			
Voltage (AC or DC) plus or minus 5%‡	6.3	6.3	Volts
Current	0.75	0.9	Ampere
Direct Interelectrode Capacitances (Approx.)			
Grid to Plate*	1.3	1.7	mmfd.
Grid to Cathode*	2.1	2.8	mmfd
Plate to Cathode*§	0.02	0.02	mmfd.
Cathode to Shell	100	100	mmfd.
DC Heater-Cathode Voltage	100 max.	100 max.	Volts
Seal Temperature	200 max.	200 max.	°C
Dimensions and Terminals,	See Outline Drawings		
Base	Small H-Wafer Octal 6-Pin		
Mounting Position	Any		

Characteristics, Class A Amplifier:

DC Plate Voltage	250	250	Volts
DC Grid Voltage:			
from a cathode resistor of¶	200	100	Ohms

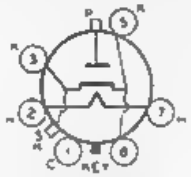


Radiotron 559



MAXIMUM ECCENTRICITY OF C_g (AXIS) OF THE FOLLOWING ITEMS WITH RESPECT TO C_g OF SHELL AS REFERENCE IS
PLATE DISC TERMINAL 0.020" SHORT OF DISC
* NOT TO BE USED FOR CATHODE OR CONTACT IN NEW EQUIPMENT DESIGN

Bottom View of Socket Connections



PIN 1 INTERNAL CONNECTION DO NOT USE
PIN 2 HEATER
PIN 3 CATHODE
PIN 5 CATHODE
PIN 7 HEATER
PIN 8 CATHODE
SHELL CATHODE RF TERMINAL
DISC PLATE

Amplification Factor	38	48	
Plate Resistance	7500	6000	Ohms
Transconductance	4800	8000	Micromhos
Plate Current	16.5	20	Ma.

RF AMPLIFIER AND OSCILLATOR— CLASS C TELEGRAPHY

Maximum Ratings, Absolute Values:

DC Plate Voltage	500 max.	500 max.	Volts
DC Plate Current	25 max.	40 max.	Ma.
Plate Dissipation	6.5 max.	12 max	Watts

* With cathode connected directly to shell.
¶ Fixed bias is not recommended.
‡ Type 2C40 may be operated at 6.3 volts plus or minus 10% in some applications.
§ With shield having diameter of 2-3/8" in plane of grid disc terminal.

The cathode of each type is brought out to three base pins in order to make possible the reduction of circuit inductance. In addition, a capacitor of approximately 70 mmfd. is connected between the cathode and the metal shell. Connection to the shell provides a low-impedance path for UHF currents to the cathode.

Type 559

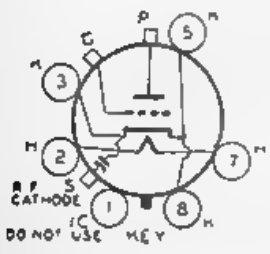
General

Heater, for Unipotential Cathode.

Voltage (AC or DC) plus or minus 5%	6.3 Volts
Current	0.75 Ampere
Direct Interelectrode Capacitance (Approx.):	
Plate to Cathode	2.70 mmfd.

Types 2C40, 2C43.

Bottom View of Socket Connections



PIN 1 INTERNAL CONNECTION, DO NOT USE
PIN 2. HEATER
PIN 3: CATHODE
PIN 5: CATHODE
PIN 7. HEATER
PIN 8. CATHODE
POST & DISC TERMINAL PLATE
DISC TERMINAL- GRID
SHELL. CATHODE RF TERMINAL

Valve DC Voltage Drop (Approx.) for a DC plate current of 24 Ma.	5 Volts
Dimension and Terminals	See Outline Drawing
Base	Small H-Wafer Octal 6-Pin
Mounting Position	Any

Maximum Ratings, Absolute Values:

Peak Plate Voltage	100 max. Volts
Peak Plate Current	200 max. Ma.
Average Plate Current	30 max. Ma.
DC Heater-Cathode Potential	100 max. Volts
Seal Temperature	200 max. °C

The above is an extract from "Radiotronics," No. 118.

NEW RMA TYPE DESIGNATION SYSTEM.

For some years past the RMA type designation system (e.g., 6D6) has been used for receiving types of valves and cathode ray tubes, but transmitting types have generally had a numerial type designation. As from 11th October, 1945, a modified form of this same type designation has been used for electron tubes and devices other than radio receiving valves and cathode ray tubes. The full RMA standards proposal No. 168 is quoted below, and it will be seen that it incorporates three basic symbols, the first being a number symbol indicating the cathode power, the second a letter symbol indicating the structure and the final number symbol which is purely a serial symbol commencing with the number 21.

As an example, type 2C21 would indicate a cathode power not more than 10 watts, a triode, and serial number 21 under this system.

It is possible to differentiate between receiving valve types under the old RMA system and other than receiving types under this modified system, by the fact that the latter all have the final number 21 or more. There is, therefore, no danger of confusion between the two systems.

The full RMA standards proposal, as adopted, is given below.

FOR TRANSMITTING AND SPECIAL PURPOSE TUBES

The type designation shall comprise three distinctive symbols. These will be, in their regular order, a number symbol, a letter symbol, and a number symbol; the significances of which are given below:—

1.—**The first number symbol** will indicate the cathode power required for normal operation in accordance with the following schedule:—

Designation.	Range of Filament or Heater Power	
1.		Zero Watts
2.	In excess of zero watts and up to and including	10 "
3.	In excess of 10 watts and up to and including	20 "
4.	In excess of 20 watts and up to and including	50 "
5.	In excess of 50 watts and up to and including	100 "
6.	In excess of 100 watts and up to and including	200 "
7.	In incess of 200 watts and up to and including	500 "
8.	In excess of 500 watts and up to and including	1000 "
9.	In excess of 1000 watts.	

2.—**The letter symbol** will indicate the structure in accordance with the following schedule:—

A. Monodes—Such as ballast tubes and vacuum-sealed resistors.
B. Diodes—Including full-wave as well as half-wave rectifiers, protective tubes, spark gaps, voltage regulators, etc.
C. Triodes—Including thyratrons, cold-cathode three-electrode control tubes, etc.
D. Tetrodes—Including thyratrons, cold-cathode four-electrode control tubes, etc.
E. Pentodes.
F. Hexodes.
G. Heptodes.
H. Octodes.
L. Vacuum-sealed types of capacitors.
N. Crystal detectors and crystal rectifiers.
P. Photo-emissive, vacuum-sealed devices; photo-tubes, photo-multipliers, pick-up tubes, etc.
R. Mercury pool types, inclusive.
S. Vaccum-sealed contactor-type switches.

3.—**The second number symbol** will be a serial designation and in no case shall be less than 21

(Continued on Page 28)

SUPPRESSION OF PARASITIC OSCILLATION WITH AN 807

It has been found that type 807, which is somewhat inclined to give trouble with parasitic oscillation under certain conditions, may be made to give satisfactory operation by the incorporation of a small resistor and by-pass condenser in the screen circuit, in the form of a suppressor resistance.

A resistance of 100 ohms has been found satisfactory when connected directly to the screen terminal of the valve, with a by-pass condenser having a capacitance of 0.01 mfd. taken from the end of the suppressor resistance remote from the screen, directly to earth. The resistor should be non-inductive, and I.R.C. type F with a maximum dissipation of 2 watts has been found satisfactory. The by-pass condenser should be of the mica type.—"Radiotronics" No. 117.

COLOUR TELEVISION ON ULTRA HIGH FREQUENCIES

The present C.B.S. System uses 525 lines interlaced 2 : 1, the interlaced fields being scanned at 120 per second. Improved definition is obtained with a 10 Mc/s bandwidth in the band 480-920 Mc/s and single side-band operation is eventually contemplated. The transmitter used a disk-seal triode (6C22) giving 1 KW peak or 600 W average; a slotted waveguide radiator gives a concentration in the horizontal direction with a power gain of 20. The use of the vision flyback period for sound permits transmission up to 10500 c/s. Of two receivers demonstrated, one gives direct vision of a 10 inch C.R Tube and the other an optical system giving a 17 x 22 inch picture. A tunable crystal mixer and 105 Mc/s I.F. Amplifier with a bandwidth of 12 Mc/s gives an equivalent input noise level of 8 uV. The color wheel uses standardised green, blue and red filters, giving an average transmission of 14%. The required bright phosphor image is obtained with an accelerating voltage of 8,000.

A NEW ELECROLYTIC SELENIUM PHOTO-CELL

This consists of a metal electrode (cathode) completely coated with metallic selenium, immersed in an aqueous solution of an electrolyte, preferably selenium dioxide together with an auxiliary electrode of a noble metal. This differs from the earlier electrolytic selenium cells chiefly in that directly electrodeposited metallic selenium gives rise to a higher sensitivity and that the selenious acid permits a higher lifetime as well as hermetical sealing of the cell.

DID YOU NOTICE IT!

Ought to be able to work at least four States from VK5 now—just couple up with one of those "Interstate" transformers advertised on page 18 of August issue, hi!—VK5UX.

THE EXPERIMENTERS' ADVISORY COMMITTEES.

Having in mind the need for improving operating conditions on the experimental bands, and being desirous of accomplishing this as far as practicable without official action, the Postmaster-General's Department, in 1936, instituted a system of Vigilance Committees throughout the Commonwealth

These Committees functioned so successfully, and their members, individually and collectively, rendered such excellent service, that considerable improvement in the standard of transmissions and operating procedure was effected

With the resumption of experimental activities on the cessation of war, the Department, in the light of previous experience, decided to again form the Committees, this time under the title of "Advisory" Committees—a title more appropriate to their function.

Many amateurs have, through the medium of the Experimental Handbook or by contact with members of the Committees, become aware of the existence of the organisation. It is thought, however, that the service being rendered by the Committees is not generally understood, and to many licencees, the Advisory Committee may mean just a name or, perhaps, an organisation set up to act as "aerial policemen." It is proposed, therefore, to give hereunder an outline of the manner in which the organisation operates.

Each Committee consists of a Radio Inspector, who acts as Chairman, and six members who are representative of experimental licencees. Briefly, the functions of the Committee are as follows.—

1—To ascertain by observation and/or other means, short of an inspection of the station, particulars of transmissions conducted contrary to the Wireless Telegraphy Regulations and departmental instructions.

2—To issue a notice or notices to the licencee concerned as the result of the observation of a breach or an irregularity

3—To supply the Department with full particulars where the friendly advice of the Committee has been ignored, where licencees concerned refuse to co-operate with the Committee or where a breach is sufficiently serious to be beyond the scope of the Committee's functions.

The Chairman, although a Radio Inspector, will not, in his capacity as a member of the Committee, take any action to discipline licencees guilty of breaches of Regulations or instructions. He will, however, refer to the Superintendent, Wireless Branch, any case which, because of non co-operation by the licencee, the Committee is unable to adjust. Any official action taken will then be at the discretion of the Superintendent and under the powers given to him by virtue of the Wireless Telegraphy Regulations.

All notices issued by the Committee are over the signature of the Chairman and, in selecting representatives, the Department is guided by the need for having men with a broadminded outlook. There is very little likelihood, therefore, of partiality being shown by members.

In addition to assisting experimental licencees by giving, where needed, friendly advice by letter, telephone, personal visit or wireless contacts, and thus trying to instil in them a pride in their equipment and transmissions and a desire to place amateur radio in Australia on a high plane, Committees have been active in other ways. They meet regularly each month and discuss possible means of improving conditions for the experimenter. They have been instrumental in having cleared up many points affecting operating conditions, and in some cases have been indirectly responsible for the easing of restrictions and the grant of greater privileges. They wish it to be realised that they are at all times amateurs, and extend an invitation to those in need of assistance to approach the Committee at any time.

It is felt that, with a proper understanding of the manner in which the Committees operate and the fact that they were instituted for the benefit of amateurs as a whole, 100% co-operation will be achieved, and amateur radio in this country will soon reach a standard of which all will be proud

CONSTANT VOLTAGE FOR LABORATORY MEASUREMENTS

CHANGE OF VOLTAGE ONLY 0.55% FROM NO-LOAD TO FULL-LOAD

MANY testing processes require constant voltage to be applied to valves or other equipment during the time that the test is in progress. It is useless to have instruments correct within 1% or less if the voltage is going to vary while the current or other feature is being read.

This is particularly important in the testing of radio valves in which some of the characteristics are critically dependent upon the applied voltages. An example of this is the Characteristic Tester recently constructed in the Laboratory of Amalgamated Wireless Valve Co. Pty. Ltd. at Ashfield. This equipment is used for the checking of a percentage of all valves manufactured each day, to see that the accuracy of the factory testing is maintained, and to carry out other tests not normally applied to the whole production owing to their complexity.

The equipment uses an electronic voltage regulator on the plate, screen and grid supply voltages. The input is from the 240 volt A.C. mains, the output is variable in voltage from 0 to 300 volts with a maximum current of 200 mA. With the maximum output voltage, the percentage voltage drop is only 0.55% for a change of load from 0 to 200 mA.

The equipment uses Radiotron type 807 valves, four of which carry the current of 200 mA. between them. The 807 is probably the most satisfactory type of valve for this purpose owing to its high current capability (72 mA. per valve maximum) and its high amplification factor. This is only one of many applications in which Radiotron type 807 may be used with every satisfaction.

Radiotron

MADE IN AUSTRALIA

FEDERAL HEADQUARTERS.

FREQUENCIES

Following on the release of portion of the 3.5 Mc/s band we are continuing our negotiations with the P.M.G. Department for the expansion of our existing lower frequency bands, and the release of some higher frequency bands. We are hoping that it won't be long before the full bands are available to Hams again.

CONTEST

The VK Contest for November has been very well received everywhere, and we think this will be an excellent opportunity for amateurs to have some pre-war excitement. There will be some great interest in the DX Clubs, which will be partaking in the receiving side. It is most unfortunate that we were unable to include the ZL Hams with us this year, but the very short time we had at our disposal to arrange the Contest precluded the New Zealanders. However, next year we hope the full dress VK-ZL Contest will re-take its old place as one of the big annual Ham World Contests.

W.A.C. CERTIFICATES

The I.A.R.U. has resumed activities in W.A.C. Certificates again. The W.I.A. is therefore receiving from amateurs their requests for and proof of W.A.C.

STOP PRESS

Federal Executive negotiations with the Wireless Branch are still proceeding, but the following new facilities are now available:—

Bands.—2,500-2,700 Mc/s, 5,250-5,650 Mc/s, and 10,000-10,500 Mc/s.

Emissions.—A0 for all bands 166 Mc/s and up. Handbook Rule 75 to be re-written to include conditions of use of A0.

Mobile and Portable.—Now available on 50 Mc/s and up without prior application or advice. Full licenced power and types of emission can be used. Announcement must be made with each transmission to the effect that operation is portable or mobile, and location must be given.

Handbook Rule 62.—This Rule concerning high power components is to be re-written to provide more liberal interpretation than at present.

Handbook Rule 25.—To be revised to allow audio tones for modulation tests, and relaying of Amateur Stations on 50 Mc/s and up.

Institute Call Signs.—Reserved for FHQ: VK3WIA. Reserved for WIA use at World Fairs, etc., VK2AUS to VK7AUS. Application made for 300 Watts permit for WIA official stations.

The following matters are still under review at date of going to press:—

Class of Licence.—WIA has stated strong case for reversion to one class, with revised power limit.

Bands.—The WIA has applied for: 27.185-27.455 Mc/s, 29-30 Mc/s, 235-240 Mc/s, 420-430 Mc/s, and Defence Communication Committee is considering our case. Expected that existing HF Bands will be extended as soon as British release approved.

Types of Emission.—WIA has applied for A4, A5, FM, and Pulse. P.M.G. not authorised to grant these as subject is under review by Parliamentary Standing Committee on Broadcasting. Matter held up by elections, but if no decision reached within six weeks WIA will approach P.S.C.B.

NOTE.—Wireless Branch Superintendents have not yet been notified of above decisions, but it is expected that when official action has been taken, Superintendents will notify respective Division Secretaries. Until then **do not ask Superintendents for information.**

Q.S.L. BUREAUS.

Another two for the Philatelists: SM3UT, H. W. Stromberg, Fack 209, Gavle, Sweden. F8KT, L. Michel, 3 Rue Bigot, Nimes (Gard), France.

Tubby Vale, VK2ANN, ex VK3MK, VK2AER and VK2ACW, writes to say he is now located at Bega, N.S.W., and well settled in the ways of married life as a Ham.

A temporary QSL card from PK4DA located at Palembang, Sumatra, expresses disappointment with the prevailing order of things at that location. Cheer up Arie, everything will soon be alright (we hope).

Brewer Spoonts, of Fort Worth, Texas, states that the following 28 Mc/s signals drop heavily in his part of the country: VK2GU, VK2MH, VK2AHP and VK2AJG.

Lt.-Col. Whatman (a real old time Ham) is QSLing all contacts made when he used the callsign VS1BC from Singapore recently. He is now VU2BC located at Signals Directorate GHQ, Delhi, India.

TG9FG, F. W. Green, c/o Pan American Airways, Guatemala City, Central America, writing under date June 23, states he has worked 40 VK stations and has QSLed them all via WIA. Desires his cards to be sent to above address and will also pass TG9JK, TG9RC and TG9JW. All are Americans and employed by Pan American Airways.

The following addresses of overseas Bureau have come to hand:—

Czechoslovakia—C. A. V., Vaclavsko Nam 3, Prague 11.
Denmark—E.D.R., PO Box 79, Copenhagen K.
Belgium—Reseau Belge, Boite Postale 634, Bruxelles.
Norway—N.R.R.L., PO Box 898, Oslo.
Finland—S.R.A.L., Linnankuja 16A8, Helsinki.
Sweden—S.A.A., Postgirokonto 52277, Stockholm 8.
Luxembourg—R.L., rue Neyperg 33, Luxembourg.
Eire—R. Mooney, "Aughnacloy," Killiney, Dublin.
Brazil—L.A.B.R.E., Caixa Postal 2523, Rio de Janeiro.
Colombia—L.C.R.A., Apartado 1266, Bogota.
Cuba—R.C.C., Lealtad 660, Habana.
Costa Rica—F. Gonzalez, Box 365, San Jose.
Peru—R.C.P., Box 538, Lima.
Chile—R.C.C., Casilla 761, Santiago.
Jamaica—Thomas Meyers, 122 Tower St., Kingston.
Mexico—L.M.R.E., Avenida Juarez 104, PO Box 907, Mexico, D.F.
Newfoundland—N.A.R.A., PO Box 660, Stjohns.
Paraguay—R.C.P., Palma 310, Asuncion.
Uruguay—R.C.U., Casilla 37, Montevideo.
Venezuela—R.C.V., Apartado 981, Caracas.
New Zealand—N.Z.A.R.T., Box 489, Wellington, C.1.
Malaya—James McIntosh, Postal Dept., Kuala Lumpur.
South Africa—S.A.R.R.L., Box 7028, Johannesburg.
Porto Rico—E. W. Mayer, PO Box 1061, San Juan.
Philippines—G. L. Rickard, 48 Ortega, San Juan, Rizal.
U.S.A., W5—L. W. May, Jnr., W5AJG, 9428 Hobart St., Dallas 18, Texas.
Canada, VE1—VE1FQ resuming appointment shortly.
VE4—Via A.R.R.L.
VE6—W. R. Savage, VE6EO, 329 15th Street North, Lethbridge, Alta.
VE7—same as VE5.
VE8—Yukon A.R.C., PO Box 268, Whitehorse, Y.T.

Cards are on hand at the VK3 Bureau, 23 Landale St., Box Hill, E.11, Victoria, for VK3's.—AB, ABN, AC, ACG, ADR, ADX, AE, AFQ, AGB, AHB, AJE, AJR, AOG, AP, APM, ARH, AT, AV, BC, BE, BG, CO, CU, CX, DA, DD, DK, DR, EC, ED, EH, EJ, EM, EO, EZ, FA, FB, FE, FP, FT, FY, GB, GC, GU, GX, HE, HP, HV, HX, IK, IU, IZ, JD, KD, KR, KS, KT, MN, MP, MQ, MS, MW, NB, NF, NU, NW, OZ, PI, PZ, QB, QD, QM, QG, QK, QN, QP, QQ, RW, SG, SQ, SZ, TB, TF, UE, UI, UO, UP, UQ, VC, VD, VE, VJ, VM, VO, VU, VV, XA, XB, XH, XN, XC, YA, YC, YG, YH, YQ, YU, ZG, ZP, ZR.

DX OF THE MONTH.

28-29 MEGACYCLES

The enthusiasm of some Hams, who month by month, endeavour to write these notes from their own logs is a valuable contribution to the Magazine. I have taken the liberty of publishing a letter which accompanied this month's notes—Editor.
Editor, "A.R.,"

It seems that another plea for reports from the country and other districts is indicated. The lack of assistance makes one wonder if the notes are of any real interest to the boys. However, it is the best we can do and is, of course, indicative only of 3CP's and my results.

We are very appreciative of VK5NR's assistance.

73's, Ingram Patterson, VK3YP

General.—Although conditions have shown a decided improvement, there have been a few days when the band did not come up to expectations. It has been possible to contact USA from 6 a.m. to 3.30 p.m., with all continents appearing during daylight hours most weekends Occasionally the band has been open until 9 p.m. and later for some of the "near" DX, such as Burma and Singapore.

Europe.—The highlight of the month has been the appearance, in hordes, of European stations around 7.30 a.m. EST. These stations are audible via South America and have been too numerous to warrant any special individual mention in these notes except to say that over 40 fone contacts were made with England, and reports up to 10 db over S9 were exchanged.

Many contacts have been made in the evenings, some of the new DX stations on the band being F8PA CW, F3FN fone, F8CX CW, PA0WL CW, OZ2DA CW, SV1EC CW, ON4LZ CW, UA3KBC CW, and D4UKW who is an unlicenced D working inside Germany—'nuff said!

VK5NR, who is the first VK to send in a contribution to these notes, has worked a magnificient list of Europeans including juicy ones like GI5UR CW, PA0OO CW, GM6MD CW, OZ4HE CW, HB9CV CW, OZ7PH fone, SM5ZF CW, OZ9P CW, SM7WL CW, and VE1EP the long way round. He complains of G QRM, particularly from fone stations in the CW band (VK2 stations please note) and is forced to call "CQ NO G's" in an endeavour to work the rare stuff

Europeans come through from 5 p.m. to 3 a.m. Contacts have been very consistent in this direction, mainly due to the times during which communication is possible—late afternoon up to 8 p.m. EST. The best fone signals have been from SU1HF, SU1MW, VQ4MNS, ZS1AX, ZS6FU, ZS6CZ, ZS6FD, OQ5BH, and the CW gang have been well represented by CR7AD, ZS5LK, ZS5BZ, ZS6BJ ZS5BS and ZS6ID

Asia.—AC4YN of pre-war fame has been contacted on 28300 CW. Rangoon Burma is quite a Ham city these days with XZ's 2DA, 2AB, 2RK and a few others working VK every evening. VS9AP, 28300 fone, has been contacted by nearly every VK with a beam and is very consistent. A rare one on 28050 CW is ZC6FP near Palestine, who comes through around 6 p.m. OD2AC, Lebanon has been contacted several times. VU stations and GI's in ex-Japanese territories are also numerous.

South America.—Pride of place goes to HK3AB who puts an R9 plus fone signal into most of Australia and who provided VK5NR with his WAC after many moons of effort. Next best is CE1AH, 28280 fone, who is also R9 around 7.30 a.m when conditions are suitable. VP8LK, 28020 CW, is a phoney although he is somewhere in South America, this information comes from VP8AD on South Georgia Island and has been confirmed by LU3DH Other reliable stations from this Continent are LU9EV, LU9AX, PY1DS, CE3AG on CW and HK3DD, YV5ABX, HC1FG on fone.

Central America, West Indies, etc.—HR1MB, Honduras, 28350 fone, is a newcomer with a terrific signal. VP9F, 28230 fone, numerous TI stations, FM8AC CW, W4IWX/MM on board ship in the Gulf of Mexico and XE1FE, 28300 fone, are some of the others from these parts.

North American and Oceania contacts are too easy and numerous to be worthy of comment.

It is desired to thank VK5NR for his splendid report, his DX contacts are enough to make a hardened DXer like VK3JD envious, and that's saying something.

50 AND UP.

50-54 MEGACYCLES

The interest in this band is rapidly expanding, judging by the few reports which are arriving. However Ken McTaggart, VK3NW, provides much of the news. Very little Interstate news is coming to hand except by hearsay. The Editor would appreciate very much, reports from each State

The following is a brief account of the doings for the month on 50-54 Mc/s at VK3NW/ANW Firstly there was the trip to Ballarat with the portable outfit. The writer now has a portable licence, VK3ANW, which was used for the first time on this outing, so if anyone on 50 Mc/s hears this call he will know that the little portable is in operation somewhere! Well we got to Stan's—VK3SE—QTH, about 3 p.m. on Saturday, 31st August, and found that he had erected a three element rotary beam co-axial fed and also a co-ax fed rotatable dipole for us. The Ballarat weather was as expected, showery and very cold. The new receiver at 3NW—8 tubes using 954 RF 954 Mixer and 955 Osc., etc., was put on the job at schedule time but never a trace of signal was heard, All the Melbourne boys were "beaming" at us for their lives. So we called CQ and imagine our surprise to hear VK3IV, Keith of Ballarat calling us. Keith was perched on Mt. Buninyong, 2,200 feet up and 6 miles out of Ballarat which is 1,400 feet. After a short chat to him we called and listened again with no result. Then we heard 3IV working Dave, 3MJ, and later 3ABA and 3GG. We could only sit and listen to the one side of the conversation! A check up on 7 Mc/s with 3YS showed that no one in Melbourne had heard a trace of our signal either. That evening for the 7.30 p.m. schedule Stan and I took the gear up Black Hill just on the edge of Ballarat and about 300 to 400 feet higher than the city, i.e. about 1700 to 1000 feet We thought the extra height might help, but never a sound did we hear from there either.

It appears that although Ballarat is 1400 feet high it lies in a saucer shaped depression with higher hills between there and Melbourne. 50 Mc/s signals apparently don't bend down into it. It is significant that the R.A.A.F. tried to put 4½ meter signals down to Melbourne but had no success and finally erected a station some miles out of Ballarat on a hill

For the Sunday morning schedule we took the gear up on Mt. Buninyong to see if we could repeat 3IV's good work and although we were 25 minutes late in starting all the boys were there and did the signals rock in!! We contacted Dave 3MJ first, got R7 and gave him R8, then followed 3BW, Arch, in Portarlington (R8, we gave R8/9), Bon 3GG (R6, gave him R7/8), and Keith 3HK at Mitcham (R8, gave him R7). Also heard was 3ABA, Jim at Box Hill on ICW R7 but Jim was missing later when we called him. I believe Reg, 3LS was calling but we did not hear him, possibly because the receiver was covering the lowest end of the band.

Distances covered were Buninyong to Melbourne 60 miles, to Mitcham about 73 miles, and Portarlington 55 miles. Power to portable was 3 watts, co-ax fed dipole 12 feet off ground. During the week-end of 7th and 8th September, Keith (3IV) came through Melbourne with his portable outfit but due to some bad luck and lack of good liasion few contacts were made and none from out of Melbourne. He visited the writer and 3QO, 3HK and 3YS before returning. VK3IV, touring the country

(Continued on Page 28)

DIVISIONAL NOTES

NEW SOUTH WALES

Secretary: Peter H. Adams, VK2JX, Box 1734 G.P.O. Sydney.

Meeting Place: Science House, Gloucester and Essex Streets.

Meeting Night: Fourth Friday of each month.

Over 120 members attended the August meeting of the N.S.W. Division. Main interest centered around the ordering of Disposals gear, which was being purchased in Melbourne by F.H.Q. for us. It seems too good to be true, to think that the Ham will receive, at reasonable prices, some of the gear that they had worked so hard over in the Services.

The lecture was delivered by Mr. M. MacDonald, of Ferguson's Radio, the subject being "The Design of Power Supplies and Modulation Equipment." The lecturer covered the subject fully and was well received He showed that there was more in transformers than mere turns of wire and pieces of iron.

A notice of motion was tabled to rescind the previous direction, that a questionnaire be sent to all members to ascertain their feelings on fone and CW sub-divisions of bands. The September meeting, when the motion will be put should see some rather keen debating on the subject.

A suggestion was forwarded to F.H.Q. that an Australian DX Century Club be formed and that only post-war contacts count.

During the past month, there has been considerable development in our association with the N.S.W. Bushfires Advisory Committee. With summer fast approaching and the drought, in many areas still unbroken, the response to a circular sent by the Committee to all country Shire Councils was most encouraging. It is now up to the amateurs to do their part in rendering further service of national importance. Whilst we know that FHQ is organising a nation-wide communications network to meet any emergency, that might arise, we feel it essential at this juncture, to proceed with the present system inaugurated some two years ago.

Sub-committees of the Bushfires Advisory Committee and the N.S.W. Division were recently appointed to investigate equipment and associated technical problems, At the last combined meeting of the sub-committees, definite action was taken to purchase a considerable number of army type 108 and 109 sets available from Disposals. These sets will replace our Ham constructed truck and pack sets and standardise equipment. The development of the network is, to a large degree, due to the efforts of Messrs Taylor and Thackeray, 2TC and 2TA of Young.

We have been asked to arrange demonstrations for the Shire Council authorities at Mudgee, Wagga, Orange and Grenfell with sets that are at present being modified. Members in these areas are earnestly asked to afford their Shire Councils the utmost co-operation. In doing so, they will not only render valuable service to the community but will again place before the public the work of the Amateur and the Institute

Two new members of the N.S.W. Council were elected during the month Basil Dale (2XX) fills the position of Treasurer in lieu of Gordon Cole (2DI). Clive Hutchinson (2YP) was elected a Councillor while John Moyle (2JU) fills the vacancy as Vice-President. Both 2XX and 2YP have been strong W.I.A. supporters over many years and it is gratifying to see them taking a more active part in Institute affairs.

The N.S.W. Division congratulates FHQ on its work with Disposals—especially that of Harry Kinnear (3KN) and Bob Anderson (3WY).

Opening of the 3.5 Mc/s band from September the 1st was welcomed and quite a large number of N.S.W. amateurs, including old timers, are making use of the new territory.

The country zone system is being inaugurated again and so far two zone officers have been appointed, Harry Hawkins (2YL), for the Coalfields, and John Traill (2XQ), for Newcastle and Maitland area.

The VK2WI broadcasts are being well received by country members. Present schedule is 11 a.m. every Sunday on 7 Mc/s and it is hoped to extend this service at a later date.

The routine of writing these notes has been arranged so that it will be done in rotation by various Councillors. However, we refuse to sign these so Peter (2JX), our worthy Secretary, can be blamed for them anyway!

COALFIELDS ZONE—(Zone Officer VK2YL)

2TY, Bob, at Lochinvar, celebrates arrival of second son, and is active on 7 and 28 Mc/s and uses three element rotary on the latter band. 2DG is working good DX on 14 Mc/s. A new shack is under construction by Max (2KZ), is active on 28 Mc/s and should be on fone with a new modulator on 7 Mc/s shortly. 2XT and 2YO not active as yet. 2LB, newcomer to Cessnock, is at present rebuilding. 2MK, with a plumber's delight rotary, stops on 28 Mc/s. With a lot of new gear, 2PZ will be on all bands shortly; Chris is now on 14 Mc/s fone. 2ADT, Zone's most active Ham with 35 watts into a rotary, works twenty to thirty DX stations a day on 28 Mc/s. 2YL mostly on 28 Mc/s with a new modulator, a rotary beam, an 8JK, a long wire zepp, and a 14 Mc/s doublet. Visitors to the Coalfields would be welcomed by 2YL at Comfort Street, Cessnock.

VICTORIA

Secretary: R. A. C. Anderson, VK3WY,
Box 2611 W, G.P.O., Melbourne. WM 1579.

Meeting Place: Lecture Hall, Chamber of Manufacturers' Building, 312 Flinders Street, City.
Meeting Night: First Tuesday of each month.

The September General Meeting was well attended, about 140 members and visitors being present.

Through the illness of President Kinnear, it was realised that at the Annual Meeting the election of Vice-Presidents was overlooked. As a result of nominations received Bill Gronow (VK3WG), Herb Stevens (VK3JO) and Mr. Matthews were elected for the ensuing year, and Bill Gronow occupied the chair for the evening

Amongst those present were VK3's: PW, WQ, XJ, OT, AJH, CO, AME, UR, ZS, LZ, EA, KP, DM, CT, MN, XK, TZ, MB, ABA, MO, AP, YS, RN, ADX, SZ, QZ, AMP, FF, PC, AV, AT, IF, MX, JR, QI, LL, XA, NY, EK, EN, ARN, ZB, IK, FJ, ALW, QW, AE, YK, KC, ED, AFQ, FR, IM, AI, UK, DN, AKL, QU, LA, TF, OV, AJY, HS, LI, ET, JO, OF, QP, ADF, HB, KB, IT, PQ, TQ, RX, VK2BN, and Miss T. J. Currah, Mrs. J. W. Emmel, Messrs. Chalmers, Crowther, Hartley, Hatch, Belcher, G. Searle, Hooper, Ultmer (?), King, Elliott, Neilson, McLeod, Strickland, Timmins, Lance Smith, Pile, Taylor, Barry, Him, Gauntlett, Lee, Holland, Tew, Meallin, Alan Smith, Cains, Billings and Walsh.

The Treasurer gave a detailed statement of the Division's fignancial position in conjunction with the belated printed balance sheets which were distributed amongst the assembly.

VK3AFQ spoke at some length as to the amount of time that was, at present, being devoted to the distribution of QSL cards, which, on numerous occasions, has precluded a lecture being given or sufficient time for the boys to have an after-meeting get-together. After discussion the

Chairman called for suggestions as to ways and means of reducing the time in disposing of the cards. It is understood that a new system will be implemented at the October meeting.

The Secretary advised that all financial members would be forwarded Order Forms for Disposals Equipment which the Institute had been successful in tendering and ere this appears it is hoped that some of the material is put to good use in improving the performance of the receiver or getting more watts out of the final than heretobefore has been the case.

It has been noted that the Division has a Bendix Frequency Meter and as it may be some time before 3WI is on the air a suggestion was raised by VK3HN that a service similar to that in operation in VK5 be commenced as soon as possible in view of the narrow band widths now available. It was felt that such a service is urgently needed as those boys who have band edge crystals with stated frequencies on the holders have found that they do not coincide with the P.M.G. Monitoring Station. This matter is now in the hands of the Technical Advisory Committee.

The Administrative Leader of the newly formed Technical Advisory Committee, Herb. Stevens, briefly outlined the aims and organisation details of this Committee recently approved by Council. Details of this Committee's work appears elsewhere in this issue.

At the conclusion of general business, a brief address on "Recent Radar Developments in Australia" was given by Mr. O. L. Wissu (VK3ALW) and as the hour was getting late he promised to cover the matter fully at a later date when it is hoped that a blackboard will be available to help the lecturer explain some of the more

A.O.C.P. CLASSES, VICTORIAN DIVISION.

Applications are invited from members of the Victorian Division for the positions of (1) Class Manager; (2) Theory Instructor; and (3) Morse Code Instructor in connection with the next series of A.O.C.P Classes to be conducted by this division. Particulars regarding rates of remuneration etc., may be had from the Secretary, Wireless Institute of Australia, Victorian Division, Box 2611W, G.P.O., Melbourne Applications close on October 31st

compex matters by means other than the gesticulations of one imitating an F.

3AMP and 3KX holding the fort in Colac, and both getting well among the DX on both 28 and 14 Mc/s. Wherever there is DX, there will be found Ron, 3KX. 3AGB in Warracknabeal is an ex VK5, and is on 7 Mc/s with nice quality phone and e.c.o. 3YW is heard on 7 Mc/s with nice T9 note; has recently erected a new mast. 3TA, an old timer in Horsham, is active again. Alan (3HL) is rebuilding and will be on again soon; you can't keep an old timer down!

3TW, 3YN and 3QM seem to be the most active of the Hamilton gang; mostly all on 7 Mc/s, but 3TW is on 14 Mc/s occasionally working some nice phone DX. 3YN now has his phone permit. 3MC also has his phone permit and using grid modulation to get out nicely; has rhombic antenna on Europe and is putting another up, his score of countries is mounting steadily. 3GH, also of Coleraine, using a haywire V beam on 14 Mc/s and a

three element beam on 28 Mc/s is steadily plugging away at the DX; still some way to go for the DX C.C.

3NC, of Casterton, not heard lately, but has been putting up remarkable work on 14 Mc/s using only 4½ watts to a 6V6, reports from G are up as high as S9, with V beams and a rhombic 3QC, our Council representative, of Terang, works 7 Mc/s phone mostly. Don't know what has happened to Jack (3PA) lately, but he has not been heard for weeks. 3XI, another old timer, is on again on 7 Mc/s with phone. 3NK, Jim, seems to be the sole representative from Camperdown, and is steady on 7 Mc/s with CW. 3GN, in Ararat, is very active on several bands, has nice receiver.

WESTERN ZONE CONVENTION AND ANNUAL MEETING

This function, to be held at Hamilton on the 26th and 27th of October, promises to be the biggest and best ever held in Victoria. Tentative arrangements are for a Dinner on the Saturday night, followed by the Convention which will be held in the 3HA Theatrette, which has been loaned by the management for the occasion.

As there is a large volume of business to be discussed, it is not expected that it will be concluded on Saturday night, so there will probably be a further session on Sunday morning.

On Sunday afternoon it has been arranged to give a demonstration to the authorities of the Rural Fire Brigades. This will involve the use of mobile and portable equipment such as the FS6 and 108 army type transmitters and receivers.

One of the residents of the Hamilton district has offered the services of himself and his Moth Minor aircraft and this will be equipped with one of the transmitters and used in the demonstration.

Some of the officials of the District Rural Fire Brigades have given donations towards a trophy which will be given for a competition which, it is hoped, will be run on the week-end following the convention. It is expected that a suitable prize will be available and negotiations are in progress for a 108 transceiver or amateur gear to a similar value. This competition will be open to all financial members of the Western Zone, and the committee will make the conditions known at the Convention.

Amongst other things to be discussed at the Convention is the matter of each Zone having a representative on Council. Also there has been a suggested re-arrangement of the Zone boundaries, not only the Western Zone, but all Zones and it is expected that there will be a lot of discussion on this matter.

An invitation has been extended to members of Council to be present at this important meeting and it is hoped that one or more will be along.

To complete arrangements for the dinner and also for accommodation it is necessary to advise the Western Zone Secretary that you are coming, also stating whether you want accommodation arranged for you.

The Western Zone Secretary is M. R. Riley (VK3TN) Box 139, Hamilton

QUEENSLAND

Secretary: C. Marley, VK4CJ,
Box 638 J. G.P.O., Brisbane.
Meeting Place: State Service Building, Elizabeth St., City.
Meeting Night: First Friday of each month.

We were pleased to be able to screen several films at the August General Meeting. A couple of the talkies shown were definitely meant for "Ham" digestion, being on "Antennas" and "Ohm's Law;" a fresh programme is lined up for the September meeting. The meeting was notable for the spirited exchanges re the matter of what is being done for the country man. The plain fact of

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course is that we can't do much. A library service is being organised, the QSL service is available, and any constructive suggestions from country men re additional services would be appreciated. It has been suggested that lectures be published in "Amateur Radio" for the benefit of fellows who can't attend in person, whenever this is possible it will be done.

The Institute has on hand a number of Great Circle Maps of interest to all, they are available for the modest sum of 2/-. Here's your chance for a useful decoration for the shack walls. We also want to make it known to all and sundry that as cards accumulate for country Hams a list of callsigns will be published in "A.R." and the owners of the cards can—in the case of non-members—obtain same by forwarding a stamp or two. The service is of course free to members.

Speaking of cards, there are a few coming thru for 4HR, who we think, heads the list of DX worked in VK4 since the war. The total comprises a modest 63, with 4EL not far away with 60. 4KS with 54, 4JU 46, and 4RC 40 are runners-up. How do those figures compare with country men and, for that matter, Interstate DXers? The way they pound in at 4EL's is remarkable In response to a recent CQ Eric landed four G's, not bad for a single CQ. A juicy one worked by 4RC on the 12th September was BIZ, operating on 14 Mc/s. Bob worked him at 8 p.m. and the fellow said he was on a ship going to India.

4AB up in Ipswich has been playing around with No. 11 army type sets and on a recent QSO with a VK2 in Casino got an R7 report, on fone we might add. An addition to the fold is 4GD (late VK2LD), pounding brass in Townsville we believe. On the other side of the State 4WX is now VK2AGA. High spot of the month was 4FN on 14 Mc/s fone. Heard Frank with my own ears working a W1 too! We were pleased to hear from Harold Hobler, of Rockhampton, that the Rockhampton Radio Experimenters Association is active once again and we hope that the proposal to form a Rockhampton zone of the Institute finds favour with them.

We hear that 4EJ (Townsville) is making a hole in the local ether, using an input of 50 watts to an 809. A three element beam puts the stuff out and invariably to the tune of R9 at the other end. 4GF has been fairly quiet, although Edgar has been responsible for a nice 10 watt signal on 7 Mc/s from an 807. 4GD mentioned earlier in these notes, does the job on 14 Mc/s with a doublet; this gentleman makes a speciality of W's. 4GE, complete with clothes lines, doing his stuff with 35 watts to an 807; we had better add that the clothes line is for yanking the two element rotary around, simple isn't it? Glad to hear from you OM and Tnx.

4VH, Jack, is very busy collecting his gear and has an even busier time ahead building a 14 Mc/s rig. In general, the northern fraternity are finding 14 Mc/s very patchy. Frequently when VK2's and 3's can be heard working DX, it's just not even to be heard in North Queensland. We believe that in extreme cases they even froth at the mouth at the injustice of it all! Anyhow, it's been nice hearing from you chaps.

SOUTH AUSTRALIA

Secretary: E. A. Barbier, VK5MD,
Box 1234 K, G.P.O., Adelaide.

Meeting Place: 17 Waymouth Street, Adelaide.

Meeting Night: Second Tuesday of each month.

At the monthly meeting of the W.I.A. held last Tuesday night, visitors included VK5GB, VK5AJ, VK3QH, GW2FUD (Mr. A. Wyn Owen, a commercial operator on the "City of Sydney" at present in port), Dr. Lower, Mr. Ray Tower, Mr. B. A. Bartlett, Mr. J. Coombe, Mr. George Smith and Mr. Cunningham. The lecturer was Mr. A. Smythe (VK5MF) whose subject "Relays and their applications" was well received. A vote of thanks proposed by Mr. M. Phillips (VK5ZU) was received with acclamation.

Mr. Smythe, in his lecture, covered a great deal of ground and unfortunately for the writer spent quite a time at the blackboard giving diagrams which, for obvious reasons cannot be reproduced here. "Al" commenced by describing various types of contacts and the manner in which they could be arranged to secure efficient operation. He then described the construction and installation of various types of relays, pointing out that the mounting of relays on their side assured an easy path through the contacts to any dust, etc, that might have accumulated. He further explained that a relay, being an electromagnet, a certain amount of residual magnetism must remain in the iron core, and to prevent the relay sticking after the current is cut off it is the practice to place a piece of non magnetic material, known as the "residual," on to the armature and thus prevent the armature from actually touching the core, giving an air gap wide enough to block any residual effect. The use of a spark quench circuit across any relay contacts carrying high current was stressed by Mr. Smythe and a simple circuit consisting of a 2 mfd. condenser in series with a 200 ohm resistance across the contacts was advised. It was also stressed that all relays are not suitable for use in radio and the various types of relays and contacts were described at length with particular reference to their adjustments and usefulness with regard to radio circuits. In the standad 3,300 ohm relays the armature does not lend itself to high speeds such as keying relays, etc. The inertia of the armature is overcome in such relays by using an isthmus armature designed to offer as least surface to the magnetic field, thus permitting the armature to operate speedily as the magnetic field collapses or builds up.

By suitable design the relays can be made to operate in various ways such as quick to operate slow release, slow operate quick to release, slow make or break, quick break or make, make before break, break before make and many more types too numerous to mention. The above effects are quite simple to arrange either with contacts, copper slugs, or valve, resistance, and capacity circuits. VK5MF at this juncture displayed quite a child-like faith in his fellow Hams by passing round the assembly several types of relays for inspection. It speaks volumes for "Al's" faith that all relays had been clocked in at the close of the lecture.

Mr. Smythe then sketched on the blackboard a suitable circuit for incorporation in the average Ham shack for remote control, etc. Many questions were asked of the lecturer, the nature and quantity of which demonstrated effectively the success of the lecture.

Power rationing in VK5 has now become almost the accepted thing and activity on any of the amateur frequencies is very limited. Most of the DX can only be heard working the Eastern States and the notes this month reflect the scarceness of material. No relief is in sight and VK5 Hams regret their inability to add to the QRM at present on all bands.

It is not often that one secures the opportunity of talking in person with ones DX, but GW2FUD (Wyn Owen) attended the general meeting this month. He is a commercial operator on the "City of Sydney" and was voted a good chap by all who met him.

The frequency checking service provided by the W.I.A. South Australian Division is now functioning on 14, 7, and 3.5 Mc/s and in the hands of VK5DW is an unqualified success. So far the queue system has not invaded this field but you never know.

The new A.O.C P. class is now filled and should commence very shortly. Keen interest is being shown by the students of the post-war era which is all to the good of Ham Radio.

The official membership of the South Australian Division is now 229 members and applications are still coming in.

It is rumoured that a certain VK5 Ham had a bout of BCL trouble recently and went to great pains to do the right thing by the BCL, only to read some time later in the daily paper that the said BCL had been prosecuted for not having a current BCL licence. Wouldn't it!

The VK5 gang are very happy to welcome back Ted Cawthron (VK5JE) and Jim Sullivan (VK5JK). Both were P.O.W. in the notorious Burma Road, and I guess there were times when Amateur Radio seemed very far away, anyway we are all glad to have them back and expect to hear that Ted is once again chasing that elusive "one more grid mill!"

It has been suggested that personal paragraphs make good reading and I will be only too happy to oblige providing that one or two personal happenings are blown down my ear. Come on now "fellas" what about it, this is your column and I welcome all news.

As an indication of the DX that can be heard but dared not be called in VK5, the following was heard between twelve thirty and nine forty five p.m. on Sunday, 8/9/46 on 14 Mc/s: HK4AF, KZ5AA, VA3BC, UD6KAB, UA2BS, UA3DA, D4AND, UA3AM, OK1AW, G5LP, G8RL, F8WK, E16G, PK6HA, HB9BX, ON4NC, LA2GA, G2QO, KH6BM, LU6DJK, VS1BX, KA6FA, CE3AG, YV5AN, VS7ES, CX1CX, KA5EA

Overheard VK5JS telling several Hams that VK5KG was the number one DX station in VK5. Only Jack's natural modesty prevented him from admitting that he himself is the outstanding DX station, probably in VK. I will admit of course he is on the air quite frequently!

Mr Hugh Lloyd (VK5BC), operating at Spring Cart Gully overlooking the River Murray midway between Renmark and Berri, reports DX conditions on 14 Mc/s as being excellent at the moment. Included in his contacts for August were the following: PY2AL, LU8EN, YO5WZ, PA0JQ, SM3ZF, OZ5AG, VP4TR, D4AND, HB9P, D5F, VS1BX, F8YZ, UA3AM, ON4AU, ON4WR, G8RL, OK3MV, KL7BH, K4ES, HC1FG. Strangely enough no VK5 signals are ever heard at this location although the DX stations can always be heard calling the VK5 Hams.

Many Hams are finding the present power restrictions a decided handicap from the DX outlook and quite a few stations have been off the air for weeks. A variation of the hours available for amateurs was discussed at the General Meeting and it was unanimously decided to carry on as at present, possibly approaching the "powers that be" for a variation of hours should the restrictions still be in force during the coming DX contest.

The W.I.A. has decided to hold a field day on a Sunday in the near future possibly at National Park and also to have the December meeting take the form of a Xmas Social. Council will announce further particulars at a later date.

WESTERN AUSTRALIA

Hon. Secretary: H. B. Lang,
42 Ord Street, Claremont, W.A.

Meeting Place: Builders' Exchange, St. Georges Ter., Perth.

Meeting Night. Third Monday in each Month.

VK6DD, John, sure makes news and this time it's WAC on fone. Congrats OM, an excellent performance for a single 807 in the final. Now has V beam on Europe and you should hear them come back! VK6KW now has three element dual 10 and 20 rotary beam 50 feet high.

It sure does its stuff even if there are complications. VK6LW, Wally, has just worked his first G on fone on 28 Mc/s. His first G fone on any band for that matter. His three element 28 Mc/s beam is now in the clear, being up about 35 feet high. VK6RU still favors 28 Mc/s. Sometimes heard on 14 Mc/s but on rare occasions. Jim lands nice DX consistently on 28 Mc/s. VK6HM is building four element array for 28 Mc/s and I believe the 50 Mc/s band. VK6PJ seems to have given 14 Mc/s away. Can be heard consistently on 28 Mc/s and working some nice DX. VK6WS now has two element array on 30 feet lattice tower ready and waiting for co-ax. Then he really intends going after that DX on 28 Mc/s band. VK6MB is working on 28 and 14 Mc/s and getting out very well. Has fixed key troubles now.

VK6DN heard frequently on 14 Mc/s CW and seems to get amongst the DX. Nice fist but has some keying troubles. Filter will do the trick OM! VK6WZ no news letter from Harry this month but I'll wager if there's any activity on 28 Mc/s he'll be there trying hard. VK6HL Harry has two element rotary and doing some nice work on 28 Mc/s when that band permits. Maybe he will be on the 50 Mc/s band soon. Watch out now! VK6DJ, Bill, still pounding away at CW, when is that fone rig starting up Bill? VK6CM, another nice CW signal on 14 Mc/s. Nice keying, good fist and good operating. VK6RG, Ross, is very consistent on 28 Mc/s band, now has three element rotary and appears to have it working nicely. VK6MW yep he's back on. Bill is running a full 7 watts into a rhombic—I guess you miss the T40's and that four element rotary you had prewar Bill! VK6WH, these notes would not be complete without reference to our "beam putter upper." Still keeping himself on 7 Mc/s band. How's about getting a rig on "six" Ted?

VK6HT has Albany on the map and seems to be getting out well. Would appreciate some news from the Southern Port Harry! VK6AJ still with us and was actually heard on "ten" this week. Would like to hear more of you Jack OM. VK6SA, Jim, has resumed his sked with W2GTZ. Complains of receiver troubles or I should say, lack of good parts to complete same. VK6LM, Lionel, has three element fixed beam and is doing good work with 22 watts to his 802 final. VK6MU not heard lately, may be I'm slipping but I'll wager Mal is there getting his share with his T40 final. VK6TX still silent, still house hunting and as yet no luck. How about some activity Jack, it's about time!

There must be others active than the above mentioned "consistents," a short note to GPO Box N1002 Perth would be appreciated. Let's know what you are doing. Your rig and what have you. Remember the other chap likes to know what's going on. You can help, so go to it PLEASE!

Conditions generally in VK6 in the past month have been very patchy. 28 Mc/s really goes to town at odd periods and European signals have been excellent round 10000 to 1200 GMT. Early morning risers have been somewhat disappointed, W signals are there, but work them, that's different.

14 Mc/s band has been having its ups and downs, but at times really opens up for excellent W and European contacts—if—you have a good receiver plus the ability to copy through real QRM.

The 50-54 Mc/s band appears quiet at the moment. However, several regulars are rebuilding or revamping their gear and it is expected to see this band really open up (maybe DX) with more activity from the locals. Maybe you guys need some inducement to popularise this band. If so, here it is, your scribe will hand over (present if it sounds better) one only 807 to the first new station to work him on that band. There's one stipulation. The transmitter must be crystal controlled. Now, who wants that tube?

TASMANIA

Secretary: J. Brown, VK7BJ,
12 Thirza Street, New Town. 'Phone W 1328.

Meeting place, Photographic Society's Rooms, 162 Liverpool Street, Hobart.
Meeting Night: First Wednesday of each month.

The monthly meeting for September took place as scheduled on 4th inst. Council met at 7.30 p.m. and those present were L. Jensen (7LJ) in chair, J. Brown (7BJ), A. Finch (7CJ), C. Walsh (7CW), F. Gee (7RF), T. Connor (7CT), A. E. Allen (7PA). Correspondence and accounts were dealt with and business for special general meeting to follow was prepared.

8 p.m., Special General Meeting.—This meeting was summoned to deal with alterations, deletions, and additions to our Articles of Association, there being a number of changes necessary to bring us into line with the present conditions and practice. The articles being dealt with were the original ones drawn up at the inauguration of this Division, at that time situated in Launceston, and only minor alterations had previously been made.

Members present in addition to the Council were R. O'May (7OM), Lipscombe, Clarke, Glover, M. Loveless (7ML), E. Raynor, Richardson, A. Russell, W. Miller, D. Watson (7DW), D. Hildyard (7DH), T. Allen (7AL). Apologies were received from R. Conrad (7TR), C. Oldham (7XA), and O. S. Dahl.

Each article concerned was read in its original or existing form and the proposed alterations, etc., was read following in each case and where necessary the chairman explained the purpose of the alteration, asked for and then called for any discussion from the meeting. All alterations were accepted by the meeting, much to the satisfaction of those who had devoted so much time to preparing them. The old articles are out of print and it is proposed to reproduce the essential sections for the present so that members can be issued with a copy as is required and the revision was deemed necessary before proceeding with the copying.

Unfortunately present finances wont stand the reprinting of the entire articles at this juncture, hence the above decision which, we trust, will tide us over till better times. Maybe some rich old uncle will remember us in his last will and testament. After concluding the business of the Special Meeting it was closed and Ordinary General Meeting opened at 8.40 p.m.

Business for the meeting was unusually light, members were advised that VIH had received a visit from Len Crooks (7BQ) during the month but it had been very hurried and little time was available for visiting owing to pressure of business, we hope to see you down again soon Len with some time to spare and we'll have a jaunt around the shacks. The main item of the evening was well in progress by 9 p.m. and took the form of a lecture on Frequency Meters and Standard Frequencies given by C. Walch (7CW) and supported by lantern slides prepared by L. Jensen (7LJ). It was further supported by 7CW's Halicrafter (hotted up) and his recently constructed 100 and 1000 Kc/s S.F.O. with which practical demonstrations were given.

The subject, a most important one these times of narrow channels, etc., was well handled once 7CW got going and he far exceeded the 15 minutes he nominated, for as he proceeded, his "nerves" left him and he did the subject full justice and told of some very interesting observations he made while constructing and adjusting his own set up even to variations with commercially prepared and mounted crystals.

At the conclusion a vote of thanks, proposed by the chairman, was carried by a hearty round of applause. 7BJ was heard to say that it had taken some doing—persuading Cros to do his stuff—but it was worth it. As for the methods used—ask Cros.

The September General Meeting was held on Monday 16th and a very excellent attendance was again recorded. General business was quickly dealt with and the lecturer for the night was Major Mulder, whose subject "British and German Radio" was delivered in an instructive and interesting manner. A vote of thanks to the lecturer was proposed by Mr. J. Gabbertas and carried with acclamation.

As the time was still early members had a general get together and many and varied were the various subjects discussed. It was very evident that members appreciated the opportunity of discussing their problems in this manner.

Several interesting lectures have been arranged for future meetings, so keep swelling that attendance. We will soon require more commodius premises on present indications.

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50 AND UP.

around Ballan, at 30 m.p.h., heard VK3BW on 50 Mc/s. Signals were R9 and a dipole car antenna was used, the airline distance is approximately 40 miles.

Active on the band during the month have been 3BW, 3GG, 3KU, 3NU, 3MJ, 3YJ, 3QO, 3MJ, 3LS, 3ABA, 3HK, 3ZO, 3AJE, 3AFQ, 3IV, 3NW (and 3ANW!!), 3GB has put in an appearance.

VK3QC has been talking of making an appearance on this band and proposes to use an 832 in the final. Other country Hams who anticipate activity are 3AMP, 3KX, 3GN, 3TA, 3AGB, and 3YV.

There appears to be some activity on 50 Mc/s in VK4 as we learn that 4FB is now putting out a solid signal on that band, while 4HR, in a new location, has been heard to better advantage than hither-to. 4RY is talking of a beam—there goes the antenna coil in my receiver!

In South Australia quite a few contacts are reported on the 166 Mc/s band but a lot more Hams will have to move up to these frequencies before anything approaching consistent working can be expected. The UHF boys meet on 50 Mc/s each night at 7.30 p.m. and arrange all frequencies and schedules for experiments. Anyone interested will be welcomed with open arms as new stations are few and far betwen.

CLEARING THE ETHER.

latter is comparitively small, while the former is normally large. This fact provides positive identification of parasitic.

Beware of conductive loops in physical construction of coil mountings, etc., these loops form very virulent sources of parasitic oscillation and harmonic generation when electromagnetically coupled to RF circuits. Furthermore, such loops sometimes upset the circuit balance to such an extent that complete neutralisation cannot be achieved.

NEW TUBE DESIGNATIONS.

Use of Suffix Letter for Type Designations
(Standards Proposal No. 144)

It shall be standard to use the same type designation for both the prototype and the improved version where complete interchangeability exists between the two types, and to assign different type designations in accordance with the appropriate standard to tube types that are not completely interchangeable except that it shall be standard to permit the assignment of a suffix letter in alphabetical order, beginning with A. to the type designation of a prototype to identify the improved version where both:—

A. Unilateral interchangeability exists between the improved version and the prototype, i.e., where the improved version may serve to replace the prototype in all known, important applications but not vice-versa, and,
B. The improved version is intended to displace completely the prototype.

Typical Type Designations
1C23, 1N35, 2C53, 3C44, 6D25, 1P39.